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TSB 05-1-1	• **WELD REPAIR PROCEDURE FOR SPRING TOWER CRACKS**
Publication Date: January 5, 2005	

FORD: 1998-2005 E-350, E-450

ISSUE:

Some higher-mileage E-350 and E-450 cutaway vans may exhibit cracks in the left or right spring tower flange.

ACTION:

Frame replacement is the typical recommended service procedure to address cracks in frames, and is the only repair procedure authorized under warranty. However, the frame can be repaired effectively by welding following the Service Procedure in this TSB.

SERVICE PROCEDURE

EQUIPMENT REQUIRED

MIG welding equipment is required and should be capable of 150 amps or greater using ER70-6 welding wire.

FULL FRAME REPLACEMENT IS REQUIRED IF ANY OF THE FOLLOWING CONDITIONS ARE TRUE, DO NOT ATTEMPT TO REPAIR:

- Large cracks or cracks in locations that would prevent proper repair. Do not repair cracks in areas where a welded reinforcement plate would contact or interfere with the spring, other components, or reduce necessary clearance zones.
- RH or LH spring towers with branched cracks, or cracks that have become separated by 1/8" (3 mm) or more.
- LH spring towers with cracks more than 1.5" (38 mm) long.
- RH spring towers with cracks more than 1.25" (31 mm) long.
- Repairs to non-flat areas of the spring tower flange, where a reinforcement plate would need to be molded/fashioned, properly fitted, and welded.

REPAIR MATERIAL (REINFORCEMENT PLATE) SPECIFICATION

- Reinforcement plates used in this repair should be rectangular shaped and made from low carbon steel material similar to the spring tower material. However, other suitable shapes may be cut and used if necessary.
- The spring tower is made of low carbon steel (SAE J403, grade 1008-1010). Spring tower material thickness is approximately 0.19" (4.8 mm).
- Reinforcement plate material thickness should be in the range of 0.18"-0.23" (4.6-5.8 mm).
- Reinforcement plate approximate size should be, 4" ± 3/8" long by 5/8" ± 1/8" wide (100 mm ± 10 mm long by 16 mm ± 3 mm wide).
- Reinforcement plates should be uncoated, free of rust or oil, and have smooth edges.

REPAIR PROCEDURE

NOTE: A REINFORCEMENT PLATE IS REQUIRED TO REPAIR EACH CRACK.

1. Disconnect the battery. Use precautions to protect vehicle and customer installed equipment from damage during welding.
2. Support the vehicle on a frame hoist.
3. Remove the front wheel assembly on the side to be repaired.
4. Remove the front spring, refer to the Workshop Manual. If required for inspection or repair access, remove the shock from vehicle also.
5. Cover the wheel end, brake rotor and brake hoses with a welding blanket to protect from grinding debris and weld spatter.
6. Clean or de-grease spring tower and ensure that all cracks have been identified. Prepare suitably sized reinforcement plates for the repair.
7. (LH only), if necessary for access, remove the rear most steering gear bolt and apply tape over the hole to protect it from weld spatter.
8. Remove frame wax or E-coat from the spring tower in the areas to be welded with a Scotch-Brite™ (or similar pad) and wax and grease remover.
9. Clean up the back or inboard side of the flange in the area to be repaired.

NOTE: USE OF A STRAIGHT OR RIGHT ANGLE DIE GRINDER IS EFFECTIVE FOR REPAIR PREPARATION.

10. Use a small burr tool to grind along the crack and form a U-groove for weld metal deposit. The U-groove should extend from the trimmed flange to approximately 3/8" (10 mm) beyond the visible end of the crack. No more than 1 mm of the original metal thickness should remain in the ground area at the "bottom" of the U-groove.
11. Use a 36 grit 3" grinding disk and chamfer any sharp edges along the U-groove, and grind the spring tower flange edge smooth 1" (25 mm) on either side of the crack location.
12. Using a MIG welder, fill the crack from its termination back toward the initiation point at the trim edge of the spring tower flange.
13. Let the repair air-cool and inspect.
14. Grind the weld flush with the original outboard surface of the spring tower. The recommended grinding direction for this operation is perpendicular to the direction of crack.
15. Check the reinforcement plate for proper fit-up to the repaired area.
16. If access to the flange edge is good, position and clamp the reinforcement plate on the spring tower flange so that the plate's edge is flush with the flange edge (butt joint edge).

NOTE: IF ACCESS TO THE FLANGE EDGE IS POOR, POSITION AND CLAMP THE REINFORCEMENT PLATE ON THE SPRING TOWER FLANGE SO THAT THE PLATE'S EDGE IS SLIGHTLY INSIDE THE FLANGE EDGE (LAP JOINT EDGE).

17. Begin by tack welding the reinforcement plate in place starting at the plate's edges farthest from the crack. Check MIG welder torch access for the weld pass, then make a weld along the inside edge of the reinforcement plate (INSIDE EDGE OF THE REINFORCEMENT PLATE IS CLOSEST TO THE SPRING - VERTICAL DOWN WELD DIRECTION IS PREFERRED WHEN POSSIBLE).
18. Re-check for proper fit-up, adjust as required, and then make another weld pass along the outside edge of the reinforcement plate. A vertical down weld direction is preferred when possible. (OUTSIDE EDGE OF THE REINFORCEMENT PLATE IS FARTHEST FROM THE SPRING).
19. Cool the welded area with an air blast and inspect. If required, grind smooth to remove excess weld material and/or stress concentrations.
20. Apply corrosion inhibiting paint, Motorcraft Low Temperature Anti-Corrosion Coating (PM-12-A), to the repair area.
21. Reassemble the vehicle and secure fasteners to the proper torques, as specified in the Workshop Manual.

NOTE: VERIFY THE "T" SHAPED END OF THE UPPER SPRING RETAINER IS PROPERLY ENGAGED AND SEATED IN THE SLOT AT THE TOP OF THE SPRING TOWER BEFORE THE FASTENER IS SECURED.

NOTE: LH SIDE ONLY - IF STEERING GEAR BOLT WAS REMOVED, REAPPLY THREAD ADHESIVE TO THE BOLT BEFORE IT IS INSTALLED AND TORQUED.

WARRANTY STATUS:

Information Only - Not Warrantable
